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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/323,692	06/02/1999	SHUNPEI YAMAZAKI	0756-0980	9526

31780 7590 04/21/2004

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EXAMINER

LEE, EUGENE

ART UNIT PAPER NUMBER

2815

DATE MAILED: 04/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N .

09/323,692

Applicant(s)

YAMAZAKI ET AL.

Examiner

Eugene Lee

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 January 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-80 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-80 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 07/673,458.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1 thru 80 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sumiyoshi et al. 02-234134 JPO in view of Yamazaki et al. 4,581,620. Sumiyoshi discloses (see figures 1 and 2) an electro-optical device comprising a substrate 101; a thin film transistor comprising a semiconductor layer (source, drain, and channel regions); gate insulation film 105, insulation film 107, contacts (conductive film) 108, 109, insulation flattening film (organic resin film) 110, and display electrode (pixel electrode) 111. Sumiyoshi does not disclose a semi-amorphous structure in which Si-Si bonds anchor clusters. However, Yamazaki discloses (see, for example, FIG. 6H and column 11, lines 50-53) a semiconductor device comprising a semi-amorphous semiconductor layer 77, 79, 78. In column 12, lines 5-12, Yamazaki discloses this semiconductor layer having excellent properties as a semiconductor. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to have a semi-amorphous structure in order to have a semiconductor layer with excellent properties.

Regarding the limitation “wherein said semiconductor layer exhibits a peak of Raman spectra, displaced from a peak of single crystalline silicon to the lower frequency direction”, it was known that less crystalline structures (due to their disorganized structure) have a lower peak than single crystalline silicon. Also, see *Prior Art* paragraph below.

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Regarding claims 28, 29, 41, 42, 54, 55, 77-80, Sumiyoshi does not disclose the semiconductor layer having an electron mobility of 15 to 300 cm²/Vsec, hole mobility of 10 to 200 cm²/Vsec, or hole mobility of 10 to 200 cm²/Vsec. However, it was well known in the art at the time of invention that these ranges were typical ranges that electrons and holes moved in a operating channel of a semiconductor device. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to have these ranges for the electron mobility and hole mobility of Sumiyoshi's invention since these mobilities provide a functional current in a semiconductor device, and since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Prior Art

3. The prior art of made of record and not relied upon is considered pertinent to applicant's disclosure. See, for example, Iijima et al. '308 (see, for example, FIG. 7) where it shows how a Raman peak of a less crystalline material keeps shifting towards a lower frequency direction, due to the material's more disorganized structure.

Response to Arguments

4. Applicant's arguments with respect to claims 1-80 have been considered but are moot in view of the new ground(s) of rejection.

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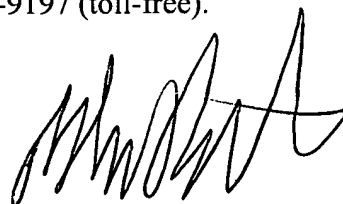
INFORMATION ON HOW TO CONTACT THE USPTO

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eugene Lee whose telephone number is 571-272-1733. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on 571-272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Eugene Lee
April 16, 2004



BRADLEY BAUMEISTER
PRIMARY EXAMINER